

## REMARKS

Applicant thanks the examiner for his attention to the application. Applicant has considered the cited references and amended the claims to forms believed distinguishable thereover.

Claims 21-39 are pending in the application. All claims have been rejected under the art. Claim 39 stands rejected for lack of antecedence under 35 USC §112. Claims 21-39 stand rejected as being obvious under 35 USC §103 over Wilson (5,156,139) in view of Leach (2,976,918) and Bender (5,067,894).

Wilson is cited for showing an oil burner having passageways 14, 16 and 22; nozzle 8 with oil and atomizing ports; and undulations at the passage 22 that are asserted to be represent applicants convoluted and riser portions.

Upon closer inspection of Wilson, it is particularly noted that the bottom passageway 14 is provided to support **electric heaters**. See the discussion at column 6, lines 38-42 and reference to “heating elements”, which clearly precludes any extension to a liquid heater. The heating element passageway 14 appears to be displaced to the side of the segments 22a and flow director plugs 30.

Similarly, the air passageway 16 appears to be displaced to the side of the segments 22a and flow director plugs 30. Wilson’s air supply thus appears to be heated with electric heaters mounted in the adjacent passageway 14. Moreover, the air passageway 16 appears to open to the output oil passageway 22b aft of the nozzle 8. The air is thus not sealed or isolated from the oil as provided with applicant’s assembly. Nor does Wilson suggest the selective blocking of his air passage with a nozzle that does not contain atomizers at the nozzle

Most significantly, **Wilson like all of the cited references does not show, suggest, infer or provide any motivation to include internal passageways at a burner for directing a heated liquid through the interior passageways of the assembly 10 to heat the air and/or oil directed to the nozzle.** A brief reference is made at column 6, line 60 through column 7, line 8 for immersing the assembly 10 in a water bath heated with the exhaust gasses. Only cursory references are provided to the construction of the posited device; and no suggestion is made to providing internal liquid passages or of how to construct or configure same. **Instead, Wilson, like Bender and Schubach, uses electric heaters to elevate the temperature of his fuel.**

Leach is asserted to teach an oil burner assembly. However, attention is drawn to the reference to “preheater” at the patent title. See also column 2, lines 53-55, which references a burner 100 and furnace 101; neither of which are shown, but clearly which are located apart from the preheater assembly of Figure 1. While Leach might reside in the same field as applicant’s invention, Leach does not disclose or suggest an integral burner heated with liquid passed through internal passageways at the burner.

Leach, otherwise, shows a housing 12 which contains a liquid and oil containing conduits 34, 39 and the purpose of which assembly is to heat oil circulated by pump 54 with water circulated through the housing by pump 70. The heated oil, again, is supplied to an undisclosed burner 100 of an undisclosed furnace 101.

In effect, Leach discloses a tubular housing 12 that contains discrete lengths of conduits 34 and 39. The housing 12 is displaced from the burner 100 and is not intended to be a part of the burner/furnace assembly. The distributed arrangement of the plumbing and control particularly teaches Leach’s foregoing intention. See also the redundant pre-

heater assembly 78, wherein surplus oil is stored in tank 79 and the tank is heated with a separate gas-fired burner 84.

In spite of the actual teachings of Leach, the examiner at page 6, lines 5-15 of the office action argues that the reference in the background of Leach at column 1, lines 27-35, that is,

“Certain ones of the systems proposed for overcoming these difficulties have relied upon electrical or gas heater units disposed adjacent to certain parts of the fuel oil supply line to heat the oil as it flows towards the burner, but these do not uniformly heat the oil so as to maintain the oil flowing to the burner at a substantially constant temperature so that uniform control of the flame cannot be maintained.”

provides the motivation and suggestion to modify Wilson to include a heated liquid passageway such as taught by Leach in Wilson.

Applicant disagrees that the examiner’s characterization of Leach’s comment provides any motivation, inference, suggestion or teaching to any such extension. The passage acknowledges nothing more than that electrical heater assemblies disposed adjacent to certain parts of the fuel oil supply line have not adequately heat the supplied fuel. **Nothing is suggested from this passage that a liquid heat source should be directly applied at the burner.** Moreover, even when heaters have been applied directly at the burner, the art only suggests the use of electric heaters such as taught by Wilson, Bender and Schubach.

**When the passage is further considered in context with the actual teachings of Leach, Leach teaches that a displaced (i.e. adjacent) liquid preheater assembly is**

**preferred.** The noted casual comment of Leach, consequently provides no motivation to modify Wilson as suggested. Nor does the comment or any of the actual teaching of the references provide any particular teaching as to how to achieve a construction at the asserted assembly that obviates the claimed invention, without undue experimentation.

Bender is cited for showing an igniter 107, a fan/turbine 108, and oil pump 110 which the examiner conveniently combines with Wilson and/or Leach to and argues obviates applicant's claims.

In short, nothing in the cited references alone or in combination discloses or suggest providing liquid passageway(s) to heat the oil at a burner and/or the air used to atomize the heated oil and especially not within a manifold as described and claimed by applicant. The thermal conductivity of applicant's manifold body is such that heat is readily transferred from the liquid to the oil and air. The manifold body also provides convoluted oil directing passageway(s) 20-26 (fig. 5), heated liquid passageway(s) 30-32 (fig. 3) and air passageway(s) 40-42 (figs. 3,4) whereby increased surface areas are provided to facilitate efficient heat transfer to the oil and air.

The passageways are also provided in tiers. The oil directing passageway(s) 20-26 are provided at a lower level that lies parallel to and directly adjacent the heated liquid passageway(s) 30-32. The riser 25 also extends through the level containing the heated liquid passageway(s) 30-32.

The air passageway(s) 40-42 extend parallel to and adjacent the heated liquid passageway(s) 30-32 (fig. 4). The passageway portions 41 are necked down and include an unnumbered obstruction (fig. 3) to compress the air passing through the passageway(s) 40-42. As noted at the specification,

*“Compressed air enters compressed air channel 40 and is heated by heat energy transferred from heated liquid channels 30, 31 and 32 to preheat device 1 as it passes through compressed air channels 41 and 42 to nozzle 2.”*

No such passageways are provided at the cited references.

Moreover, the passageway(s) 40-42 are located to facilitate the alternative use of a high-pressure oil nozzle. In the latter instance, the mounting of the high-pressure oil nozzle is such that the channel 41 is blocked and because the nozzle doesn't provide atomizing ports, oil is prevented from leaking from the air passageways 40-42.

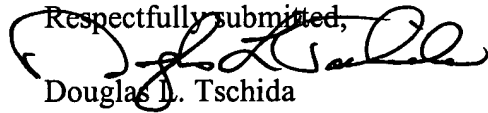
The foregoing distinctions are particularly provided for at the amended independent method claim 21 and apparatus claims 24, 33 and 35. That is, each claims a manifold having internal passageways that can couple to sources of oil, heated liquid and air. The manifold and passageways are configured in tiered, planar layers such that heat from the heated liquid is transferred to heat the oil and air immediately prior to being discharged from the nozzle. The liquid passageway is mounted between the oil and air passageways. Where the nozzle doesn't include an atomizing port, the nozzle blocks the air supply passageway. Where the nozzle includes an atomizing port and a source of air is coupled to the third passageway, the air is also heated and atomizes the hot oil as it is discharged from the nozzle. Seals are also provided to seal oil from the air.

With the foregoing amendments to the claims, the application is believed distinguishable over the art and in a condition for allowance. No new matter has been entered with any of the foregoing amendments. Applicant requests the examiner's reconsideration of the application and an early notice to the allowance thereof.

If any matters remain that can be handled with a telephone conference, the

examiner is encouraged to contact the undersigned.

Respectfully submitted,



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